TRACES OF ABORIGINAL OPERATIONS IN AN IRON MINE NEAR LESLIE, MISSOURI

By W. H. HOLMES

Early in April, 1903, a communication was received by the Bureau of American Ethnology from Dr S. W. Cox, of Cuba, Missouri, stating that evidences of ancient mining operations had been discovered in an iron mine operated by him near Leslie, Franklin county. This report was confirmed by Mr D. I. Bushnell and other St Louis archeologists, and the present writer, who is especially interested in the quarrying and mining industries of the aborigines, repaired at once to Leslie to make a study of the interesting phenomena.

It was found that the miners had encountered a body of iron ore, of unknown depth and horizontal extent, lying immediately beneath the surface of the soil on a gentle slope reaching down to the banks of Big creek, a branch of Bourbois river, and that they had removed the ore from a space about a hundred feet wide, one hundred and fifty feet long, and to a depth at the deepest part of between fifteen and twenty feet. In beginning the work traces of ancient excavations were observed, penetrating the soil which covered the surface of the ore body to a depth of from one to five feet; and as the work progressed it was found that the ore had been fairly honeycombed by the ancient people, the passage-ways extending even below the present floor of the mine. There were many partially filled galleries, generally narrow and sinuous; but now and then larger openings appeared, two of these being of sufficient dimensions to accommodate standing workmen.

In the débris of the old excavations many rude stone implements were encountered, and upward of a thousand of these had been gathered by the miners into a heap on the margin of the mine. These sledges are exceedingly rude, consisting of hard masses of stone or hematite weighing from one to five pounds, and roughly grooved, or notched, for the attachment of withe handles. The

great number of these implements made it certain that extensive operations had been carried on by the ancients, but the exact nature of the work was not readily determinable. The first impression was that the compact masses of hematite were sought for the purpose of manufacturing implements such as were employed by the mound-building tribes in many parts of the Mississippi valley; but examination revealed few traces of the shaping of this material, save that it had been used in making the rude sledge-heads or hammers found in the mine. In breaking up the ore the white miners encountered small irregular seams and masses of flint, but these were too limited in extent and too brittle in texture to have been employed successfully in the manufacture of implements. Some workable flint was observed in the vicinity of the ore-body, and flakes and rejectage of blade-making, as well as a number of well-finished spearheads, arrowpoints, and leaf-shaped blades were intermingled in the filling of some of the superficial pits; but this flint-shaping appears to have been an incident only of the work on the site. The evidences of this shaping work are not sufficient to warrant the conclusion that the extensive tunneling was carried on for the purpose of obtaining material for that purpose. Besides, this flint is found in large bodies in many sections of the general region, and could readily be obtained in quantity.

It was observed, in approaching the mine, that the exposed surfaces of the ore and the ground about were everywhere a brilliant red. The workmen were red from head to foot, and anyone venturing to handle the ore soon found his hands smeared with red oxide, repeated washing being required to remove it. The prevalence of the red color suggested at once the idea that the site had been an aboriginal paint mine, and that the red and yellow oxides were mined and carried away to be used as paint — an article of utmost importance in the aboriginal economy.

As the charges of dynamite used by the miners broke down the walls of the mine, it was observed that the deposits were of irregular hardness, that certain portions of the ore were very compact and flinty, containing much quartz, and of dark bluish or purplish hue, while the larger portion was so highly oxidized as to be easily broken up. Extending through the ore body in all directions were

RECENTLY EXPOSED FACE OF AN IRON MINE, SHOWING SECTIONS OF THE ANCIENT GALLERIES

pockets and seams of soft red and yellow oxides, and in places there were irregular openings and partially filled cavities. Two of these openings are shown in plate L, a view of the face of the mine taken by Mr Clark McAdams of St Louis. The miners would drill with great difficulty through the hardest of ore, to have the drill drop suddenly into a cavity of unknown depth. It was difficult to discover just which of these openings and cavities were artificial, or whether or not they had been penetrated by the ancient workers, as changes

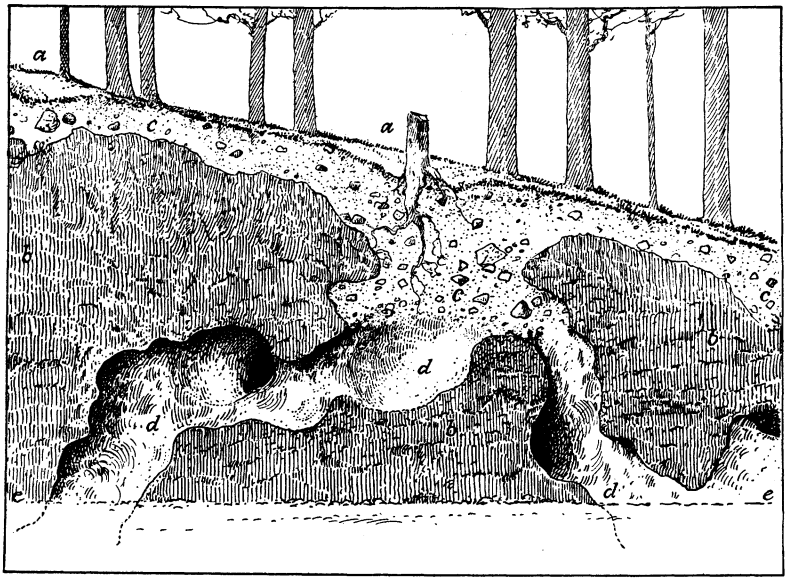

FIG. 30.—Section indicating the manner in which the galleries or borings penetrate the ore-body. (*a*, *a*, Surface traces of ancient pits. *b*, Ore-body. *c*, Filling of excavations. *d*, Borings of the ancient miners. *e*, Floor of mine.)

are constantly taking place in such ore-bodies. Percolating waters fill up or clear out the passage-ways. Generally, however, as the walls were broken down the openings were found to connect with the superficial pittings, as indicated in figure 30.

It appears certain that the larger openings and tunnels in which the sledges were found had been opened up or enlarged by the ancient miners, and that in the search for other bodies of the desired product they had followed weak lines and partially filled passage-ways, removing the projecting masses of hard ore, where these

interfered with the work, by means of the sledges. Sketches of these rude implements are shown in figure 31. It is apparent that the sledges could have had no other function than that of crushing and breaking up the solid masses of ore to be used in the manufacture of implements, or in opening new passage-ways through the ore-body. Although these sledges were made in the main of compact bits of the ore and of the flinty masses associated with it, they correspond very closely in general characteristics with the bowlder sledges used in such great numbers in the copper mines of Lake Superior. Nearly all appear to have been hafted for use, and the

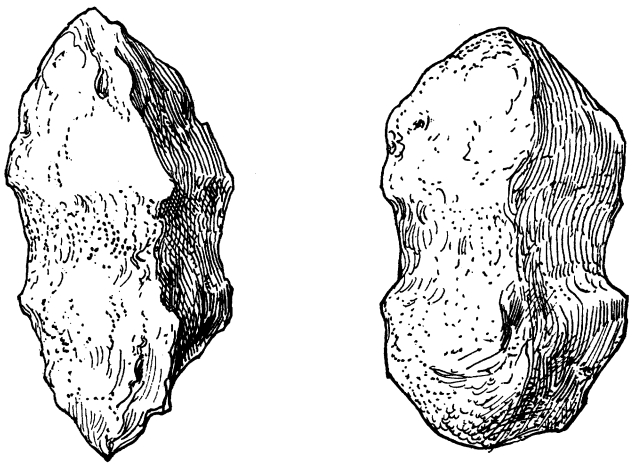

FIG. 31.—Sketches of the rudely shaped mining implements.

majority show the rude grooving or notching necessary for the attachment of the withe haft. It would seem that in the narrow passages of the mine the use of hafted implements would be inconvenient if not entirely impracticable, and we are left to marvel at the feat accomplished of penetrating a compact ore-body in dark, sinuous passages hardly roomy enough to admit the body of a man, with the aid of rude bits of stone held in the hand. The character of these openings is indicated clearly in plate L, which shows the face of the mine as freshly exposed by the mining operations; and figure 30 indicates somewhat imperfectly the manner in which the tunnels or borings penetrate the ore body connecting with the su-

perficial pits and extending to unknown depths beneath the present floor of the mine.

Numerous examples of the implements found and specimens of the ore in its various phases, together with a large mass of the compact ore, one surface of which shows the markings of the mining tools of the aborigines, were presented to the National Museum by the proprietor of the mine, Dr S. W. Cox.

I have now examined mines and quarries of the aborigines in twelve distinct materials, and each new example has added to my former high estimate of the enterprise and perseverance of the native peoples when engaged in the pursuit of their normal industries.